

Year 10 Paper 2 Mark scheme

1.

- (a)(i) 35, 44 1
 35, 46 1
 (ii) around 50% each 1
 (b)(i) $2\text{Br}^- + \text{Cl}_2 \rightarrow \text{Br}_2 + 2\text{Cl}^-$ 1
 all symbols correct 1
 equation balanced 1
 (ii) iodine is less reactive than bromine so it would not displace
 bromide ions 1 **6 marks**

| Question Number | Answer | Mark |
|-----------------|--|------|
| 2(a) | X - dilute hydrochloric acid / HCl Y - limestone / calcium carbonate / marble / CaCO_3 | 2 |

| Question Number | Answer | Mark |
|-----------------|--|------|
| 2(b) | In a syringe / by downward delivery or, recognizable diagram / by upward displacement of air | 1 |

| Question Number | Answer | Mark |
|-----------------|---|------|
| 2(c)(i) | Yellow / orange - not red <i>allowed red!</i> | 1 |

| Question Number | Answer | Mark |
|-----------------|--|------|
| 2(c)(ii) | Carbonic (acid) H_2CO_3 | 2 |

| Question Number | Answer | Mark |
|-----------------|-------------------|------|
| 2(d) | ionic covalent | 2 |

8 marks

| Question Number | Answer | Mark |
|-----------------|--|------|
| 3(a)(i) | Fermentation Dehydration / Elimination of water | 2 |

| Question Number | Answer | Mark |
|-----------------|----------|------|
| 3(a)(ii) | Addition | 1 |

| Question Number | Answer | Mark |
|-----------------|--|------|
| 3(b) | Any two for 1 mark each: (dissolved in) water yeast warm / stated temperature in range 20-35 °C <i>allowed also no</i> | 2 |

| Question Number | Answer | Mark |
|-----------------|--|------|
| 3(c) | $C_2H_5OH \rightarrow C_2H_4 + H_2O$ Award 1 for correct formulae of ethanol and ethane and 1 for H_2O and no coefficients | 2 |

| Question Number | Answer | Mark |
|-----------------|---|------|
| 3(d) | $ \begin{array}{c} H & H \\ & \\ H-C & -C-O-H \\ & \\ H & H \end{array} $ NB the - O - H may be condensed to - OH | 1 |

| Question Number | Answer | Mark |
|-----------------|--------------------------|------|
| 3(e)(i) | (di) amine (Allow animo) | 1 |

| Question Number | Answer | Mark |
|-----------------|--|-------------|
| 3(e)(ii) | alternating circle and square correct linkage between blocks (NH-CO- is minimum) two NH and CO groups in correct positions is minimum $ \begin{array}{c} H & & H & O & & O \\ & & & & & \\ -N & - & \square & -N & - & C & - & \bigcirc & - & C & - \\ & & & & & & & & & & \\ & & & & & & & & & & \end{array} $ must have 'continuation bonds' for 3 rd mark ALLOW terminal COOH or NH ₂ if brackets used round repeat unit | 1 1 1 |

| Question Number | Answer | Mark |
|-----------------|--------------------------|------|
| 3(f) | Low Weak molecules | 3 |

15 marks

4. (a)

| | | | | |
|-----|----|--|---|---|
| i | M1 | magnesium chloride/nitrate/sulphate/other soluble magnesium salt | | 1 |
| | M2 | sodium/potassium/ammonium carbonate / other soluble carbonate | | 1 |
| ii | M1 | correct balanced equation such as | CONSEQ on b(i) even if either reagent incorrect. Must give required product Award 2 marks for any correctly balanced equation that uses formulae from the names in bi Award 1 mark for any incorrectly balanced equation that uses formulae from the names in bi Award 1 mark for any correctly balanced equation that uses formulae different from the names in bi equation with any incorrect formulae scores 0 | 2 |
| | M2 | $\text{MgCl}_2 + \text{Na}_2\text{CO}_3 \rightarrow \text{MgCO}_3 + 2\text{NaCl}$ | | |
| iii | M1 | filter / centrifuge and decant | | 1 |
| | M2 | Wash (residue/solid) with water | M2 and M3 dependent on an attempt at M1(eg "sieving", "decant") | 1 |
| | M3 | dry by warming gently / leave (in warm place) to dry / uses filter/absorbent paper /dry in (warm) oven / place in dessicator | | 1 |
| | | | Points must be in correct order to score all marks | |

(b)

| Answer | Mark |
|--|------|
| <ul style="list-style-type: none"> Pipette / burette to measure sulfuric acid Sodium hydroxide in burette Indicator used and colour change (NOT universal indicator) Add sodium hydroxide gradually near end point (and swirl) | 4 |

11 marks

why? -> add & note!

5.

| | | | | | |
|---|--|----|---|---|---|
| a | | M1 | bromine (water) | Reject bromide, but mark M2 and M3 as if bromine accept KMnO_4 | 1 |
| | | M2 | (stays) yellow / orange / brown / no change / no reaction | Reject red Purple if KMnO_4 | 1 |
| | | M3 | (becomes) colourless / decolourised | Ignore clear ignore discoloured Decolourised if acidified KMnO_4 brown if neutral KMnO_4 green if alkaline KMnO_4 if only KMnO_4 allow any of above three accept 1,2-dibromopropane (if bromine) or propan(e)-1,2-diol (if KMnO_4) | 1 |
| b | | M1 | alkene(s) | Accept olefins | 1 |
| c | | M1 | $\begin{array}{cc} \text{H} & \text{CH}_3 \\ & \\ \text{---C---} & \text{C---} \\ & \\ \text{H} & \text{H} \end{array}$ | M1 for correct structure (ignore continuation bonds) | 1 |
| | | M2 | | M2 for continuation bonds | 1 |
| | | | | M2 dependent on M1 Ignore brackets and subscript letters Award 0 marks if double bond shown | |
| d | | M1 | poly(propene) / polypropene / polypropylene | | 1 |

7 marks

6.

| | | | | | |
|---|----|----|--|---|---|
| b | | M1 | yellow | | 1 |
| | | M2 | OH^- | | 1 |
| c | i | M1 | melts / becomes a ball | M2 Accept other words indicating movement such as darts / whizzes / skids / skates / shoots | 1 |
| | | M2 | moves (on surface) | | 1 |
| | | M3 | fizzes / bubbles / effervescence | | 1 |
| | | M4 | disappears / dissolves / becomes smaller | | 1 |
| | | M5 | white trail | Reject white precipitate | 1 |
| | | | | Any two for 1 each Ignore flames/fires | |
| | ii | M1 | $2\text{Na} + 2\text{H}_2\text{O} \rightarrow 2\text{NaOH} + \text{H}_2$ | M1 all formulae correct | 1 |
| | | M2 | | M2 balancing | 1 |
| d | i | M1 | flame / explosion | Accept any more extreme observation from ci, eg moves more quickly, faster bubbling, but not just reacts faster/more violently | 1 |
| | ii | M1 | 10 - 14 / value within this range | Reject range outside this, eg 9 - 12 | 1 |
| | | | | | |

8 marks

7.

- | | | |
|-----|--|---|
| (a) | potassium manganate(VII) gives a coloured solution but potassium chloride does not | 1 |
| (b) | diffusion | 1 |
| (c) | diffuse more quickly | 1 |
| (d) | particles move more quickly in warm water | 1 |
| | particles would collide more often/with more force and move further apart more quickly | 1 |

5 marks